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Environmental Policy Coordination in ASEAN: The Case of Waste From Electrical and Electronic Equipment

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Among numerous environmental challenges in the ASEAN region, the rapid growth of volumes of waste from electrical and electronic equipment (e-waste) has increasingly drawn international attention. Economies face huge demands for electrical and electronic products, while governments are confronted with difficulties dealing with mounting volumes of e-waste. Furthermore, lucrative transnational shipment of discarded electric and electronic devices calls for a regional response to the issue. While ASEAN has failed to come up with a common policy response, certain member states have pushed ahead with their own legislation in an attempt to address this urgent issue. This study sets out to identify the determining factors which have disabled ASEAN in terms of agreeing on a common policy response in the case of dealing with e-waste. Based on the assumption that states act according to expected gains, the study applies a game theoretical approach to analyse the developments.

Keywords: Policy Coordination; E-waste; Electric and Electronic Equipment; Trade; ASEAN

Die Bewältigung der rasant anwachsenden Menge an Elektroschrott zählt zu den großen umweltpolitischen Herausforderungen der ASEAN-Staaten. Während sich die Volkswirtschaften einer immer größer werdenden Nachfrage nach elektrischen und elektronischen Geräten gegenübergestellt sehen, vermögen es die meisten Länder nicht adäquate Entsorgungswege für Altgeräte aufzubauen. Zusätzlich zur inländischen Produktion gilt es auch mit oftmals als Gebrauchtprodukt getarntem, importiertem Elektroschrott umzugehen. Eine dringend notwendige regionale Koordinierung wurde von ASEAN noch nicht in Angriff genommen. Diese Studie geht der Frage nach, warum auf Ebene von ASEAN keine Lösungsansätze zu dieser Problematik zu erwarten sind. Zur Analyse der Entwicklungen bedient sich die Arbeit eines spieltheoretischen Ansatzes.

Schlagworte: Politikkoordinierung; Elektroschrott; elektrische und elektronische Geräte; Handel; ASEAN

Introduction

Over the past decades, solid waste has become one of the most visible environmental

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issues of countries in the ASEAN region, and the rapid rise in the volume of discarded electrical and electronic equipment (waste electrical and electronic equipment/WEEE) represents another emerging challenge for South-East Asia. Due to economic growth and increased living standards, demand for electrical and electronic equipment (EEE) is growing, but so are streams of waste from these same devices. Volumes of e-waste are growing three times faster than volumes of average solid waste (Goosey, 2004). The volume of obsolete PCs in developing countries is estimated to surpass those of the developed countries by 2016 to 2018. And by 2030, some 400 to 700 million personal computers will become obsolete in the developing countries (Yu, Williams, Ju, & Yang, 2010). Many Asian countries are experiencing a rapid rise in the volume of e-waste. Thailand has reported a rise in the volume of e-waste by an annual 12 percent. Inappropriate handling of e-waste causes severe harm to the environment and to human health since many electronic components contain hazardous substances, such as lead or cadmium. Since recycling, dismantling, and disposal of WEEE requires appropriate facilities, advanced methods, and trained personnel, mounting streams of waste represent a massive ecological threat and pose risks to human health, particularly in the developing countries. Inappropriate methods of treatment first result in a localised contamination of the soil, the aquatic systems, and the air. Eventually, pollutants spread over a larger region, flow down the water system, and enter the food chain.

Besides the issue of domestically generated WEEE, there is rising concern about transboundary shipments of WEEE (Greenpeace, 2008). Large amounts of discarded EEE and second-hand EEE are shipped across the globe for the purpose of recycling, reuse, or disposal. Some estimated 50 to 80 percent of the collected domestic e-waste of the United States is not recycled domestically but exported to developing nations (Puckett & Smith, 2002). Increasing amounts of e-waste and second hand EEE are shipped from developed nations to developing countries (mainly to Africa and Asia) but also within the developing nations. Many countries in Asia are actively trading second hand appliances (Puckett, Westervelt, Gutierrez, & Takamiya, 2005). Hong Kong, China, Singapore, and Malaysia are the main recipients of shipments of discarded EEE from the EU. Electronic scrap and second hand EEE contain valuable components, and imports have been a source of secondary raw materials. Trade of discarded EEE provides a lucrative business opportunity for international traders and

generates income for thousands of operators in the informal sector, at the cost, however, of human health and the environment. With the number of personal computers and electronic devices correlating to the gross domestic product of an economy, we can expect continuous growth rates of WEEE in the near future (Robinson, 2009). As a result, the region will be increasingly affected by the mounting volumes of WEEE and the consequences of inadequate treatment, recycling, and disposal of e-waste. When addressing the issue, environmental efforts often come in conflict with economic interests.

The main purpose of this article is to identify the factors that disable ASEAN from agreeing on a common policy response on e-waste. While many claim that lack of political will and awareness is the main reason for the failure of policy coordination, this study attempts to go beyond that point and seeks to reveal the underlying incentives for decision makers which prevent them from proceeding with environmental cooperation. Based on the assumption that states act according to expected gains, the study applies a game theoretical approach to analyse the developments.

Regional Integration and Policy Coordination

Across the globe, we can witness the formation of regional cooperation. However, joint efforts and cooperation between countries rarely occur out of altruistic reasons but are rather driven by potential benefits in respect of each country's national interests. A major benefit from cooperation lies in the reduction of transaction costs, such as easier access to information. However, cooperation often entails a loss of sovereignty which leaves decision makers reluctant to cooperate. Given that political will is shaped by the involved actors' perceptions of the situation and the expected gains from cooperation, we can assume that cooperation is more likely in cases where the problem identification of the negotiating parties is identical and win-win-situations occur. Therefore, the overall pace and intensity of regional integration and policy coordination is determined by the capabilities of resolving disputes, overcoming obstacles of cooperation, and balancing distributive gains among the members.

From a game-theoretical point of view, inter-state cooperation is described by the collective action problem, including two kinds of situations: collaboration and coor-

dination games. Collaboration games describe a situation where actors are attracted to defect from an existing agreement due to short-term benefits. As a consequence, policy makers may opt for decisions that lead to situations which are not-pareto efficient (Ostrom, 1990). Unless the dominant strategies can be broken down, actors will defect from cooperation and the agreement is doomed to fail. Coordination games describe a situation where actors face difficulties to reach an agreement in the beginning. Here, the main concern lies in the coordination of the varying interests of all involved parties. While actors share an identical set of goals, specific differences prevent them from reaching an agreement. Setting the board for repeated games, the distribution of gains needs to be taken into consideration as changes in the gains may influence the actors' interests.

The perception of achievable benefits plays a significant role in the formation of agreements. The greater the gains an actor expects from cooperation, the more likely the member state will opt for joint action. With the rise of environmental challenges, the potential gains from cooperation also rise. Regional environmental cooperation is most likely to emerge when all parties perceive the issue as an immanent threat that causes economic losses or hinders further development, but is less likely when an agreement runs counter to national interests or contradicts existing sets of policies.

In general, collective action problems can be overcome by two responses. First, by the emergence of an international institution that serves as a mediator between the interests of countries and takes over major coordination functions. While negotiations through an existing institution reduce transaction costs, a central body provides a platform for resolving disputes and stimulating negotiations. The institution is set in charge of information gathering and engages in informal consultation about preferences and state policies. It thus functions as a mediator between the bargaining parties (Snidal, 1985). Second, the existence of a leader may ease substantial obstacles for policy coordination and cooperation. For fear of the consequences, a strong leader may prevent free-riding. The leader may be from within the group (focal point) or an extra-regional actor with strong acceptance and influence. As the European integration process has shown, the road to interstate cooperation and regional integration is often bumpy, requires time and a substantial amount of political will, and is also influenced by external developments.

ASEAN and Environmental Governance

Environmental issues first appeared in the Association's political agenda during the late 1970s. Environmental awareness and environmental regionalism have evolved slowly and in three major phases (Elliott, 2011). In the first phase, ASEAN introduced the first subregional environment program (ASEP I) which mainly emphasised securing the availability of natural resources for economic development. Over time, environmental ambitions evolved and a growing commitment to accepting common environmental norms and principles could be witnessed. During the second phase (from the late 1980s until the late 1990s), the focus shifted to transnational threats. Environmental awareness in many countries has grown. In 1993, the ASEAN Senior Officials on the Environment (ASOEN) agreed to develop the *ASEAN Strategic Plan of Action on the Environment*. The new Action Plan should shift focus towards sustainable development strategies, and greater emphasis was placed on the creation of networks that should contribute to the policy making process. The third phase is characterised by the formation of formal relations within the community. ASEAN established a system of environmental goals and objectives. Under the *Bali Concord II* (2003) the organisation of ASEAN reiterated its intention to strengthen the institutional mechanisms and to form an ASEAN Community based on three pillars: the *ASEAN Political-Security Community* (APSC), the *ASEAN Socio-Cultural Community* (ASCC), and the *ASEAN Economic Community* (AEC). Regarding regional environmental governance, the three pillars created new possibilities to integrate environmental topics to a broader forum. First, the formation of the APSC mainly aims to strengthen cooperation on political and security issues (ASEAN, 2009). Second, with the creation of the AEC the region aims to form a single market and transform into a single production base. As the case of the EU showed, market integration requires advances in the harmonisation of the regulatory frameworks in order to rule out obstacles in the flow of goods due to varying environmental standards and regulations. Third, the establishment of the ASCC provides even more opportunities to strengthen environmental cooperation across numerous fields, such as sustainable development, unemployment, environmental degradation, transboundary pollution, and disaster management.

The *ASEAN Charter* of 2007 marked an important step in the evolution of ASEAN, since it not only provides a basic framework that governs relations among the mem-

ber states but also transforms ASEAN into a more rule-based organisation with a legal character (Lin, 2010). The missing legal identity has been blamed as one of the reasons why ASEAN not only reacted slowly in reaching agreements but also failed to implement them at the national levels. The charter marks an improvement for policy coordination by providing a constitution that governs the relations between the member states and by allowing leaders to meet more frequently. But deeper integration requires a substantial strengthening of institutional structures, decision-making processes, and a solid enforcement system. On the one hand, regional leaders are attempting to emulate an EU-like community but on the other hand they are reluctant to cede power to a central body and the organisation is still left without a binding community law. Competition among ASEAN member countries, a narrow focus on national interests, and the fear of losing sovereignty hinder deeper cooperation and policy coordination in ASEAN. As a direct consequence of the conflicts of interest among the member states, ASEAN leaders have come up with a more flexible concept of consensus finding by introducing two formulas: “ASEAN minus X” and “2 plus X”. While the “ASEAN minus X” formula allows specific member states to join ASEAN agreements at a later point in time, the “2 plus X” formula explicitly allows ASEAN states to form new sub-regional agreements within the ASEAN framework (ASEAN, 2006). However, since there is neither an institutional body in charge of controlling the sub-regional groups nor a limit to the number of agreements, such agreements contradict efforts to cooperate and may eventually lead to a weakening of the overall regime (Chiou, 2010).

From the establishment of ASEAN on, the decision making process can be described as informal elite-based diplomacy based on consultation and consensus. As decision makers did not want to see their newly independent nations put under the control of an external power again, member states only agreed to cooperate as long as decision making respected each member state’s sovereignty. The association has strictly followed the principle of non-interference in other member states’ domestic affairs, and any form of coercion among member states is ruled out. While these principles may have been useful to avoid internal conflict, they also slowed down progress in regional integration. Scholars have repeatedly pointed to the principle of non-interference as a major obstacle for deeper integration and collective action (Haacke, 2003; Tay, Estanislao, & Soesastro, 2001). Like other issue areas, environmen-

tal governance follows the common principles of the ASEAN community. In general, decision making in ASEAN takes place at two main levels, the inter-state and the domestic level. Major agenda setting and decision making regarding ASEAN takes place by informal diplomacy through government channels, where the Summit of the ASEAN heads of state and government is the highest decision making body. In the meetings about specific issues, participants represent the positions of the individual states. Environmental issue such as e-waste only have a chance to be dealt with by ASEAN when they are put on the agenda of this highest level of decision making. The second level consists of political decision making processes within each member country. Actors at the national level include the political parties, interest groups, and NGOs. On several occasions, business associations have been invited by the governments to consultations and hearings. ASEAN encourages the participation of civil society organisations in its regional programmes, but there has been slow progress in the overall integration of non-state actors in the policy formation process of the environment protection area. Although several countries across the region possess an active NGO sector, access to policy makers seems to be more difficult for NGOs since they typically have limited access to decision making processes. As a consequence, ASEAN governance is mainly determined by government officials and has a top-down hierarchical structure. Transboundary issues, such as haze from forest fires, climate change or trade of e-waste, connect the inter-state and the domestic decision making since implementation and enforcement remains a domestic issue. Since member countries have the final decision making power in environmental policy making, the organisation's structure favours environmental cooperation by implementing soft laws which leave compliance at the national levels. While ASEAN environmental programmes and agreements are highly ambitious in their wording, they often lack effective implementation and enforcement mechanisms. As a member state faces no serious consequences in the case of non-compliance, incentives for implementation and enforcement are low (Aggarwal & Chow, 2010). The principle of non-interference and safeguarding member states' sovereignty is continued at the cost of the environment (Koh & Robinson, 2002, p. 679). So far, there has been no agreement, declaration or common policy output from ASEAN that explicitly targets improving the emerging situation of e-waste in the region.

The Basel Convention

During the 1970s and 1980s many industrialised countries exported their hazardous waste to developing nations for final disposal. After two decades of negligence, the *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention)* – which came into force in 1992 – should have brought an end to the malpractices by providing mechanisms to control international movements of hazardous substances. The *Basel Convention* includes lists of hazardous and non-hazardous wastes, including several types of e-waste, such as batteries, cables which contain lead, CRT glass etc. In order to ban illegal shipments, the *Basel Convention* requires notification of the importing country about the export of hazardous waste prior to shipment. As a result of the *Basel Convention*, the shipment of hazardous waste for disposal substantially declined. However, now there is great concern about the shipment of EEE for the purpose of reuse and recycling, since goods that are exported for the purpose of reuse do not require pre-shipment notification of any form or pre-shipment approval. Due to that loophole, the *Basel Convention* is limited in its ability to restrict the trade of discarded EEE, shipped as second hand appliances. The *Ban Amendment* restricts the export of hazardous waste from developed countries to developing countries and is applicable to exports of hazardous waste for any kind of purpose – including recycling. However, many countries have not signed the Amendment yet (see Table 1).

Table 1: ASEAN Parties to the *Basel Convention* and *Ban Amendment*

Brunei Darussalam	<i>Basel Convention</i> ratified 16 Dec 2002	<i>Ban Amendment</i> accepted 16 Dec 2002
Burma/Myanmar	-	-
Cambodia	<i>Basel Convention</i> ratified 02 Mar 2001	-
Indonesia	<i>Basel Convention</i> ratified 20 Sep 1993	<i>Ban Amendment</i> accepted 24 Oct 2005
Lao PDR	<i>Basel Convention</i> ratified 21 Sep 2010	-
Malaysia	<i>Basel Convention</i> ratified 08 Oct 1993	<i>Ban Amendment</i> accepted 26 Oct 2001
Philippines	<i>Basel Convention</i> ratified 21 Oct 1993	-
Singapore	<i>Basel Convention</i> ratified 02 Jan 1996	-
Thailand	<i>Basel Convention</i> ratified 24 Nov 1997	-
Vietnam	<i>Basel Convention</i> ratified 03 Mar 1998	-

Source: Author's Compilation

Existing Legislation on E-Waste in ASEAN

Unlike other forms of waste, treatment of WEEE follows a different logic, since it contains both hazardous as well as valuable materials. A tonne of discarded mobile phones contains about 240 g gold, 2.5 kg silver, 92 g palladium, 92 kg copper, and 38 kg cobalt, worth about EUR 10,000. In 2008, about 1.3 billion mobile phones were sold worldwide and the worth of gold alone accounts to USD 1.1 billion. An estimated USD 1.35 worth of retrievable materials per mobile phone makes trade a lucrative business (Hagelüken, 2010). Countries in the region have witnessed the formation of large informal sectors that engage in collecting, reselling, refurbishing, dismantling, and recycling obsolete and second hand EEE. Trade flow of discarded and second hand EEE has intensified across the globe. Although the largest sources of discarded EEE are still the OECD countries, non-OECD countries are increasingly active in the trade of used EEE. Particularly, Asia has become a hotspot for shipments of WEEE and second hand EEE. Large amounts of second hand appliances are shipped to Hong Kong and Singapore, mainly for the purpose of re-export (Ministry of the Environment Japan, 2011). However, also other ASEAN countries are actively importing various kinds of wastes, including used EEE and WEEE (Yoshida & Terazono, 2010). As the region lacks a common policy on the issue, we can find a patchwork of regulations across the ASEAN member states. The following section provides an overview of existing legislation regarding the treatment of WEEE and trade of WEEE in ASEAN member states. With the exception of Burma, all ASEAN member states have ratified the *Basel Convention*, by which they agree to follow the procedures of notification laid out by the Convention.

Vietnam has no restrictions on the export of hazardous wastes and other wastes for recovery or final disposal. The country has not yet formally ratified the Amendment to the *Basel Convention* but has indicated that it is in a preparatory process to do so. In 2004, Vietnam prohibited the import of e-waste for the purpose of re-export and in 2005 it tightened the ban on imports of e-waste, regardless of its purpose. With the lack of stringent import controls, the illegal influx of EEE continued. A major route for regional trade of second hand EEE is between China and Vietnam. Beijing promotes the trade in the region with the reduction of value-added tax on exports of second hand EEE. By importing used EEE from industrialised countries, repairing

or refurbishing, and then re-exporting them to developing countries, Chinese actors are utilising the high demand for second hand appliances in the region (Shinkuma & Huong, 2009). A growing domestic industry and lower tax for imports of brand new EEE will reduce the demand for used EEE in the long run. In general, Vietnam still lacks high awareness of the ecological risks connected to the treatment of WEEE.

Indonesia restricts the import and the export of hazardous wastes and other wastes for recovery and final disposal.² The country follows the provisions of the *Basel Convention* regarding exports of hazardous waste, e-waste, and used EEE. In 1994, Indonesia has enacted national regulations on hazardous waste management but the general awareness of threats from e-waste remains low. Since the issue of e-waste receives no big public attention, policy makers see no immediate need to deal with the problem and trade continues to flourish due to weak enforcement. There is only one facility that is able to treat hazardous waste properly for the whole country. E-waste is still shipped to Indonesian markets, and illegal imports of second hand electronics and e-waste continue (Gross, 2010; Kojima, Yoshida, & Sasaki, 2009). Indonesia is largely dependent on imports of EEE since the domestic electronic industry is not yet fully developed. There are only about 80 large and 150 small-medium electronic manufacturers. As a result, more than half of the required components need to be imported. Due to the lack of a strong domestic electronic industry, demand for cheap EEE is met by imports or second hand products. In Indonesia, about half of the overall electrical and electronic goods market is estimated to be smuggled. Currently, the government aims to stimulate the domestic industry by restricting the import of used electronics for direct reuse.

In Thailand, e-waste is defined by domestic regulations and declared as hazardous material. All trade of e-waste officially requires governmental approval. Additionally, also the import of used EEE for reuse requires governmental permission. Thai regulations request registration for producers, importers, exporters, and sellers of WEEE and used EEE. However, besides this comprehensive regulatory framework, Thailand faces massive problems enforcing the regulations. As of now, WEEE is largely dismantled by the informal sector, despite the existence of a subsidised national collection system. From an economic perspective, the electrical and electronic sector plays a

² According to the regulations, waste exports are allowed provided that the shipment has received a written permission from the competent authority of the destination as well as the exporting country.

crucial role as the country has a strong domestic EEE industry. Thailand has over 800 electrical and over 900 electronic factories. While most electric suppliers are domestic SMEs, electronic suppliers are mainly international joint-ventures (Electrical and Electronics Institute Thailand, 2007). As a large producer of EEE with a strong export focus, Thailand is concerned about legislation implemented by its trading partners. The EU represents Thailand's second largest export destination. As a response to the EU environmental directives on electrical and electronic equipment (EU-WEEE and EU-RoHS), Thailand has introduced a domestic standard on RoHS-conformity including a labelling scheme that was launched in early 2009.

Malaysia has national definitions of waste used for the purpose of transboundary movement. Export of e-waste for the purpose of final disposal is prohibited. Malaysia restricts the import of hazardous wastes and other wastes for final disposal and for recovery.³ Import of hazardous wastes for recovery requires written approval by government authorities. The country restricts the export of hazardous wastes and other wastes for final disposal. Malaysia lacks a domestic recycling scheme that can handle the mounting streams of WEEE adequately. The amount of WEEE being discarded is estimated to equal 1.165 billion units (or over 21,000 million tonnes) by 2020 (Basel Convention, 2009). The country suffers from a huge divide between the largest sources of WEEE and the number of licensed e-waste collectors. In 2008, the whole country only had 107 licensed contractors for collecting and processing e-waste (Agamuthu & Victor, 2011). As a consequence, only a small fraction of the e-waste is treated properly. The government of Malaysia is currently working on a draft for regulating the control and management of e-waste. Meanwhile, public awareness of the issue of WEEE remains generally very low.

Similar to other countries, the Philippines also struggles with rising volumes of e-waste and trade of electrical and electronic equipment. Electrical and electronic equipment accounts for about 40 percent of the country's total imports. The number of clearances regarding the importation of second hand EEE and e-scrap issued by the government is rising over time. In 2005, nearly 100,000 tonnes were imported from Korea and Japan (Peralta & Fontanos, 2006). The country lacks a comprehensive policy framework for e-waste, and authorities have failed to issue an official definition

3 For details, see: *The Environmental Quality Act 1974*, (Amendment 1996) Section 34B; and the Customs (Prohibition of Import) Order 1998 Amendment 2006.

of e-waste (Alegre & Borcena, 2010). While the country has a vibrant market for used EEE, recycling of electronics is a rather new development. Thus, only a small fraction of the obsolete electronic items are brought to recycling facilities or to final disposal at the landfills. Obsolete equipment is either stored or reused (Terazono et. al., 2006).

Singapore has definitions of waste used for the purpose of transboundary movement and restricts the import and export of hazardous wastes and other wastes for final recovery and final disposal under the *Hazardous Waste Act* which went into force in 1998. The Act requires permission from the Pollution Control Department prior to any export, import or transit of hazardous wastes (National Environmental Agency, 2009). While in general Singapore does not allow export of waste for disposal, the export of hazardous wastes can be allowed for recovery purposes if there are no waste treatment facilities available domestically. The import of hazardous wastes for recovery is granted on a case-by-case basis. In Singapore, the electronics industry takes a vital position for the country's overall economic strategy. Singapore enjoys a high level of environmental awareness. Despite all the regulations and requirements, cases of illegal shipment of hazardous waste are still reported.

Cambodia – due to its rapid economic development – has developed an enormous demand for EEE. Since it lacks its own domestic EEE industry it is heavily dependent on the import of brand new and second hand EEE. While Cambodia does not produce any kind of EEE at all, the country possesses a large second hand market, and cheap second hand products play a dominant role in satisfying the domestic demand. Second hand appliances are imported from China, Finland, France, Hong Kong, Japan, Malaysia, the Republic of Korea, Singapore, Thailand, and the USA (UNEP, 2007). In order to meet growing domestic demand, national regulations allow the import of used EEE for reuse and do not require government approval prior to shipments of used electronics for reuse. Between 2000 and 2006, Cambodia imported almost a million units of TV sets, about 200,000 air-conditioners, about 91,000 refrigerators and about 30,000 washing machines. For fear of an influx of malware, the government bans the import of second hand computers, while other kinds of WEEE are unregulated. Cambodia does not consider used EEE with the purpose of reuse as a hazardous waste and in 2007 there was no record of a single e-waste recycling facility in the country. As a consequence, WEEE and used EEE are collected, renewed, recycled, dismantled, and disposed of by the informal sector (UNEP, 2007). Sorting materials at the scrap yards

is often done by children. The country lacks a legal framework on e-waste and thus has no specific regulations on e-waste. No specific governmental agency has been put in charge of managing the increasing streams of used EEE, and environmental considerations are not taken into account when dealing with WEEE. Awareness of the negative consequences from improper treatment of e-waste is generally at a very low level in Cambodia (Basel Convention, 2007). Valuable materials such as metals are sold abroad for recycling purposes (UNEP, 2008).

Brunei Darussalam is in the preparatory process of restricting the import and export of hazardous wastes and other wastes for final disposal and for recovery. The country is currently drafting legislation aimed at controlling trade in hazardous wastes in accordance with the *Basel Convention*. Regulations will be implemented in the *Draft Environmental Order* of Negara Brunei Darussalam. In Brunei, e-waste accounts for about one percent of the total generated waste (Department of Environment, Parks and Recreation, Ministry of Development, 2006). While the country has disposal facilities, it lacks facilities for recycling, recovery or re-use.

Extended Producer Responsibility in ASEAN

In recent years, there have been increasing efforts across the globe to address the emerging issue of e-waste by reorientation of the management approaches. In tackling environmental challenges, the concept of extended producer responsibility (EPR) has received increased interest. Originally defined by T. Lindhqvist (2000), it represents an environmental protection concept which makes manufacturers of products responsible for the whole life cycle of their manufactures, including the post-consumption phase.

The EU adopted two directives with the aim of tackling the issue of e-waste: the *Waste Electrical Electronic Equipment Directive* (WEEE-Directive 2002/96/EC) and the *Restriction of Hazardous Substances* (RoHS-Directive 2002/96/EC). While the EU WEEE directive mainly aims to reduce concerns about waste-management, the EU RoHS directive restricts the use of hazardous substances contained in EEE. The ban of six hazardous substances aims to prevent contamination from hazardous substances in the case of improper treatment or disposal. Only products that fulfil the require-

ments are allowed to be sold on the EU market. The implementation of the directives has also triggered reconsideration of policies regarding WEEE among non-EU countries, particularly in those with close trade links with the EU (Ibitz, 2009). In general, the concept of EPR has drawn the attention of policy makers in Asia. Thailand, for instance, has responded with national legislation with similar aims (“Thailand RoHS”) (Tingsabath & Jantarasarsophon, 2007). However, due to varying trade dependencies, not all ASEAN member states feel similar pressure to respond. In 2005, Thailand published draft legislation aimed at tackling the stream of e-waste.⁴ This regulation can be seen as a direct response to the EU WEEE-Directive. Thailand has adopted regulations that shift the financial responsibilities for recycling of e-waste to the producers. The overall policy includes measures that require electrical and electronic producers to use a certain minimum level of recycled input (Manomaivibool & Vassanadumrongdee, 2011). Also, Vietnam has revised its *Environmental Protection Law* (2005) to include the financial responsibilities of producers for the collection for EoL products. The concept of EPR can also be found in the Indonesian *Law on Rubbish Management* (2008), where manufacturers are given more responsibility for dealing with EoL products (Saputra, 2011). In Malaysia, the 2007 *Solid Waste and Public Cleansing Management Act* allows the government to put responsibility for the collection of products on the manufacturers, assemblers, and importers. There is hope that in the long run, such environmental considerations may well spread to some other ASEAN countries. However, the successful application of EPR is difficult in developing countries, since – as is the case for e-waste – the informal sector takes centre stage in recycling. Since formal recyclers have to comply with certain kinds of environmental standards and follow the labour protection measures, the informal sector – which ignores such regulations – receives a competitive edge that leads to a weakening of the regulated sector. Furthermore, EPR implementation is facing difficulties as it is often not easy to identify the producers or the importers. For products that are assembled by small-scale businesses, it seems infeasible to put responsibility on the producers. In the case of smuggled items or product imitations, it seems infeasible to apply this approach.⁵ With a background of such high rates of smuggled and imitated equipment in the region, the application of EPR based legislation seems not viable.

4 The Act on the Promotion of Hazardous Waste Management from Used Products

5 For more please refer to Hotta, Elder, Mori, & Tanaka (2008).

Analysis

Although problem awareness about e-waste has sharpened among the leaders of ASEAN, the issue has clearly not gained enough political weight to find its way to the top levels of ASEAN decision-making. While regional integration could be strengthened by the harmonisation of regulations and standards on the treatment of WEEE as well as common definitions of e-waste, major challenges arise from the region's diversity in terms of economic development and market structure which makes policy coordination harder to achieve. The integration of the new members between 1995 and 1999 was mainly driven by security concerns and less by economic considerations, but it is also interfering with environmental policy coordination. Preferences and interests of member states diverge greatly in the region, and member states see no immediate need for action as a stricter framework would limit the inflow of secondary raw materials and/or hinder the development of a strong domestic EEE industry. The experiences of dealing with e-waste vary largely among the member countries and so do the perceptions of the benefits and gains from the issue. Thus, neglecting the e-waste issue at the highest political talks avoids the emergence of potential conflicts.

The logic of markets and economic considerations are definitely crucial factors in this complex matter. The ASEAN region is characterised by economies that engage as exporters as well as importers of used EEE. From an economic perspective, e-waste represents a valuable resource that may lower the production costs for the domestic industry. While the founding members all engage in the production of EEE, the least developed countries do not even possess their own domestic industry. Richer nations, such as Singapore, Thailand, and Malaysia are both importers and exporters of second hand equipment. Countries tightening the regulations on imports of obsolete EEE would cut off local industries from cheap supplies which would run counter to national economic development strategies. Thailand's move to enact national regulations similar to those of the EU derives more from national economic interests than environmental concerns. Bangkok aims to promote domestic industry actors to adjust their products to comply with European requirements to keep up market access to the EU market. Domestic demand in less developed countries is met by imports of brand new and second hand equipment or by the refurbishment of discarded prod-

ucts. Their dependence on foreign producers results in a more cautious approach regarding any regulation of used EEE and second hand equipment. Countries such as Indonesia and Vietnam are now in the initial phase of building up a domestic EEE manufacturing industry. For other countries, such as Thailand, the Philippines, Malaysia, and Singapore, the electronic industry already enjoys a vital position within the overall economy. With rising prices of raw materials in international markets, competition for secondary resources generated from e-waste will stiffen. While countries with higher economic development and higher income levels, such as Singapore, Malaysia, and to a lesser degree also Thailand and the Philippines, have already had experience of setting up advanced recycling stations for hazardous wastes, countries with relatively low economic development (CLMV) have not developed adequate recycling and treatment facilities. Since landfills of the least developed nations do not report that large streams of e-waste as expected, it can be assumed that large parts of the equipment is repaired, refurbished, stored, and disposed of by the informal sector. Less advanced economies in the region do not possess formal waste management schemes where e-waste streams could be integrated (Damanhuri, 2009). Across the region, the collection and recycling of WEEE is largely accomplished by the informal sector, which provides income for thousands of people. In most member states, the informal sector is the largest player in the collection and recycling of WEEE and is in competition with the formal sector. Since the former operates under a lower cost structure, it is able to pay higher prices for discarded EEE and thus undermines the formal national collection and recycling schemes (Liu, Tanaka, & Matsui, 2006). So far, only the more advanced economies were able to establish facilities that can deal with the large amounts of hazardous waste in a more appropriate manner.

Regional trade of WEEE and second hand EEE is driven by economic incentives such as cheap and abundant labour, low environmental standards, and a high demand for second hand EEE or secondary raw materials. National governments have no immediate incentives to favour a ban on international trade of WEEE and used EEE since this would cause economic losses and an increased need for raw material imports for production processes. Due to fears of potential economic losses, it seems unlikely that regional governments will agree unanimously on a regional framework to tighten regulations on the import of WEEE and trade of e-waste. The import ban on second hand EEE – as implemented by Vietnam – is rather an effort to promote the

build-up of a domestic industry than an environmental protection effort. While at first glance a ban on the transboundary shipment of WEEE (*Basel Convention*) seems to be an appropriate method for limiting the flow of e-waste, in practical terms the attempt fails due to implementation and enforcement issues at the national level. Although most countries have laws and regulations in place to restrict the trade of hazardous waste, enforcement of the regulations represents a major issue.

Effective regional cooperation can only emerge on the basis of mutual trust. However, as the case of e-waste demonstrates, ASEAN is not able to mediate interests to shape a consensus to implement a common position on dealing with e-waste. Besides, the region lacks a clear frontrunner that pledges to address the issue. In all countries economic interests prevail over environmental considerations and the competition among the economies prevents closer cooperation and policy coordination. Furthermore, from major debates about the classification of e-waste as hazardous waste and the ban on hazardous-waste exports, we know that also several external actors do not want to see the emergence of a strong environmental regime in the region. As long as member states continue to focus on short-term economic gains while neglecting benefits from cooperation such as health improvements, productivity increases, reduction of transaction costs or information sharing, progress in integration and regional policy coordination will be slow.

Conclusion

Since transboundary challenges can be addressed more efficiently by joint regional efforts, ASEAN is discussed as the potential promoter of environmental protection in the region. Although the challenge of e-waste has received increased attention from various actors in the region over the last years, ASEAN has failed to come up with a common policy response in order to tackle the issue. The Association faces strong need to step up its efforts and reconsider its position towards regional environmental governance. Effective regional environmental governance must be based on co-operative policy formulation in combination with concrete mechanisms to facilitate the implementation of policies. As of now, ASEAN environmental governance allows member states to set their national efforts according to their individual national

interests. Due to its weak institutional structures and its fragile legal framework, ASEAN is not equipped with enough authority to enforce existing agreements, and so it is unable to adopt EU-like-directives.

There is a strong need to establish ASEAN community law to govern the Association with principles that can be applied at the national level. Without the adoption of a binding community law, ASEAN will not be able to develop into an effective and successful community. Major obstacles derive from its organisational structure as well as the massive gap in the member state's economic development and their national interests. Although the leadership seems to be increasingly aware of the rapidly worsening environmental base in the region, concerted efforts in environmental cooperation seem to be harder to achieve than economic cooperation – simply because the mutual gains are not perceived immediately, and it does not provide exploitable gains for the domestic politics.

In the case of e-waste, ASEAN is facing difficulties agreeing on a common policy response due to the complex situation of varying perceptions and diverging interests. In cases where interests and perceptions among member countries diverge, the decision-making principles lead to a standstill. Thus, ASEAN fails to act as a mediator for policy coordination. Regional integration can only be intensified when member states are aware of the potential gains from cooperation and cede a certain degree of sovereignty to a central authority. For enhanced regional environmental governance, ASEAN would need to form a central bureaucracy with enforcement authority. However, the organisation suffers from a general resistance to legalism and formalism as its member states are reluctant to show political commitment to hand over power to a central body due to a lack of regional identity but also due to misunderstandings of potential gains from cooperation. Individual countries would rather follow their self-interest than seek collective benefits. Given the large variations in levels of economic development, market structure, institutional structures, technological capabilities, environmental awareness, and the progress of basic environmental protection legislation, it seems unlikely for the ASEAN region to implement a common policy for the issue of e-waste. As a consequence, the first steps to address the issue need to take place at the national levels by promoting national recycling industries under stricter regulations, and establishing organisational linkages between the formal and the informal sector. A further fruitful step could be the introduction of a certifica-

tion scheme for facilities with proper methods of recycling. In addition, specific tax policies and subsidies could direct waste streams towards government approved and certified facilities (ASEAN Secretariat, 2009).

A redefinition of environmental degradation (such as from improper treatment of e-waste) as a security threat could raise awareness of the issue at the regional level and bring new impetus for action (Dokken, 2001). Since the current emphasis on consultation and consensus building hinders the overall progress of regional integration and policy coordination, a redefinition of the range of application of the principles could launch new dynamics (Wiebe, 2000). The environmental realm could provide a first testing ground for fundamental reforms of the application of the principles, such as setting environmental measures with a binding character. Furthermore, since a region-wide policy response on e-waste is unlikely to be achieved, a multi-phased approach under the formula of ASEAN minus X could provide a viable option (Akenji, Hotta, Bengtsson & Hayashi, 2011). In such a case, several more developed ASEAN countries could move ahead with an agreement based on common interests. After gaining benefits from the agreement, other countries may follow the example. However, such a multi-phased approach must be implemented with care, since it also includes a risk of further weakening the overall community. The existence of a frontrunner could ease the path to set out a more rigid policy framework, such as in the EU, where integration processes in certain issues areas are driven by individual member states. However, ASEAN lacks an accepted frontrunner in the case of dealing with e-waste. Although Thailand, Malaysia, and Singapore are actively promoting the production of green electronics, their main motivation derives from economic benefits by gaining access to developed nations' markets. Their path could provide a model for other countries to follow.

As an organisation ASEAN must focus more on the potential gains from cooperation. The region could benefit greatly by strengthening its regional environmental governance and creating regional mechanisms to manage cross-border environmental issues better. A concerted effort could provide competitive gains, boost productivity, and provide public goods that are unlikely to be produced by markets or individual economies, such as connected infrastructure and platforms of information sharing.

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